US006550270B2

(12) United States Patent
Rudick

(10) Patent No.: US 6,550,270 B2
(45) Date of Patent: Apr. 22, 2003

(54) **SEAL COMPRESSION MECHANISM FOR A REFRIGERATION DEVICE**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/063,926**

(22) Filed: **May 24, 2002**

(65) **Prior Publication Data**

US 2002/0124590 A1 Sep. 12, 2002

(51) **Int. Cl.**[7] **F25D 19/02**; F25D 19/00
(52) **U.S. Cl.** **62/448**; 62/297
(58) **Field of Search** 62/440, 448, 449, 62/237, 297, 382

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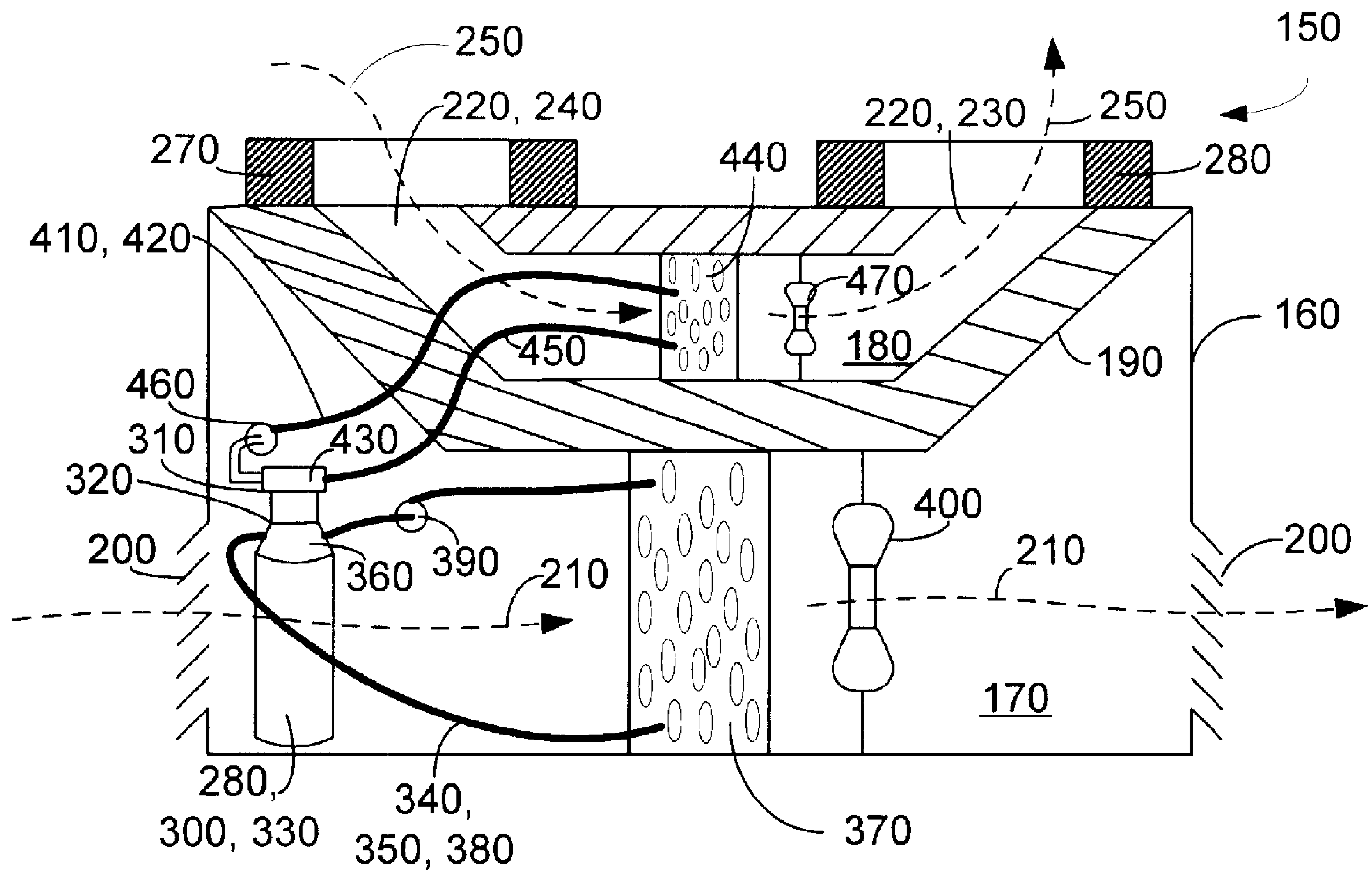
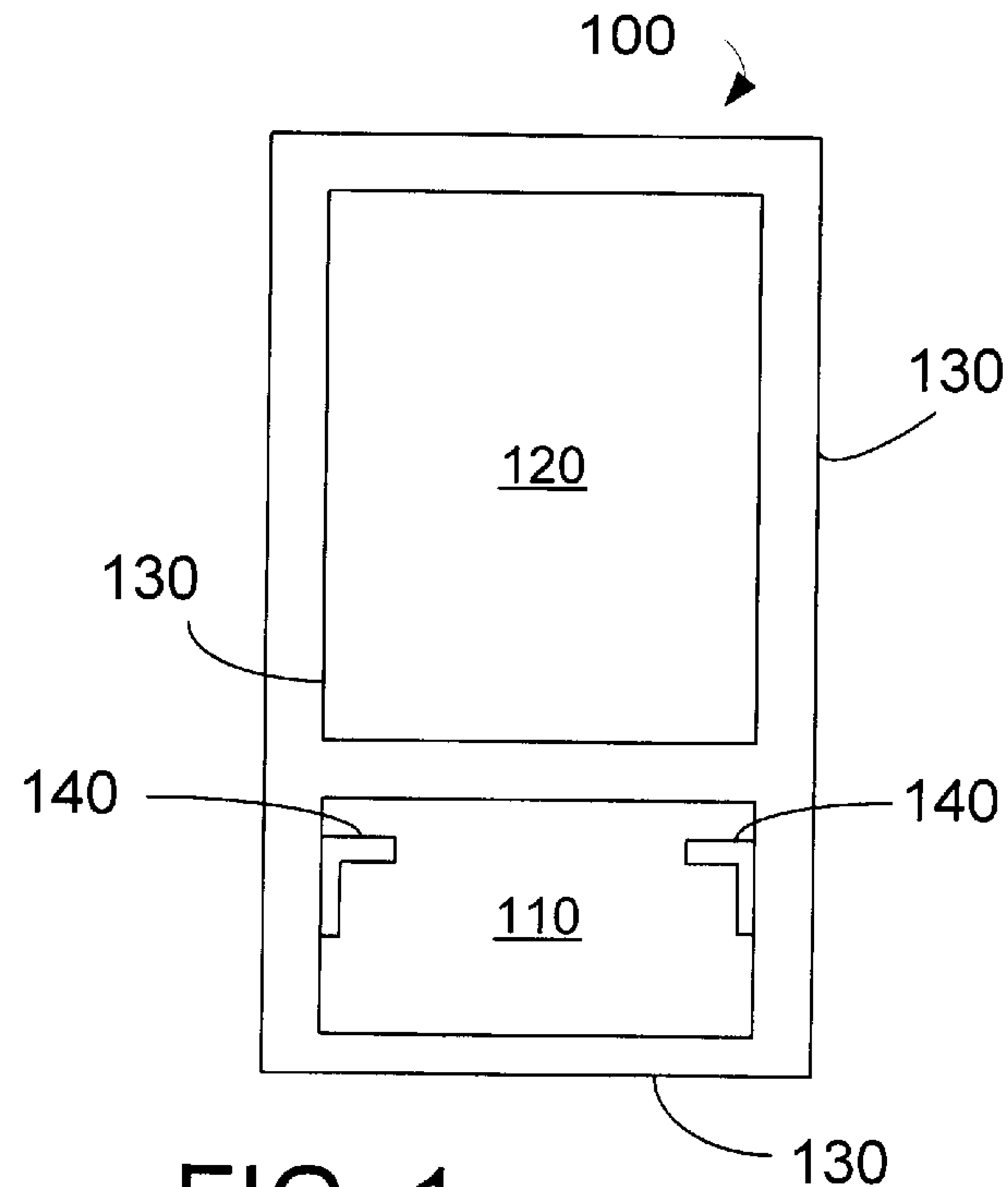
(57) **ABSTRACT**

A refrigeration device. The refrigeration device may include a refrigeration deck frame and a refrigeration deck removably positioned within the refrigeration deck frame. The refrigeration deck may include a sealing member and a seal compression mechanism positioned thereon. The seal compression mechanism may include a rotating member so as to urge the sealing member against the refrigeration deck frame.

20 Claims, 5 Drawing Sheets




100
130
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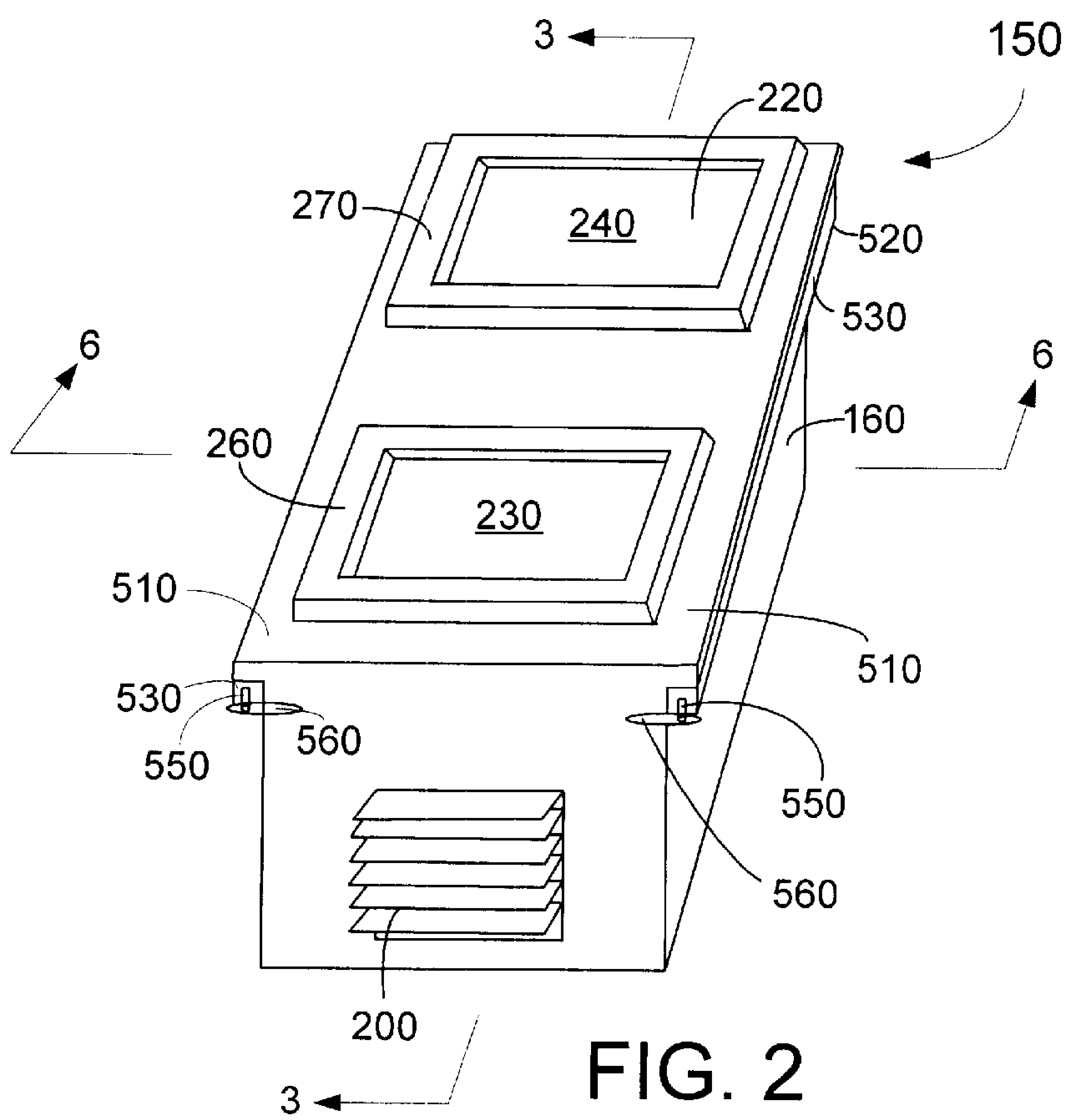
110
130

FIG. 1


3
220
150
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6
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160
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510
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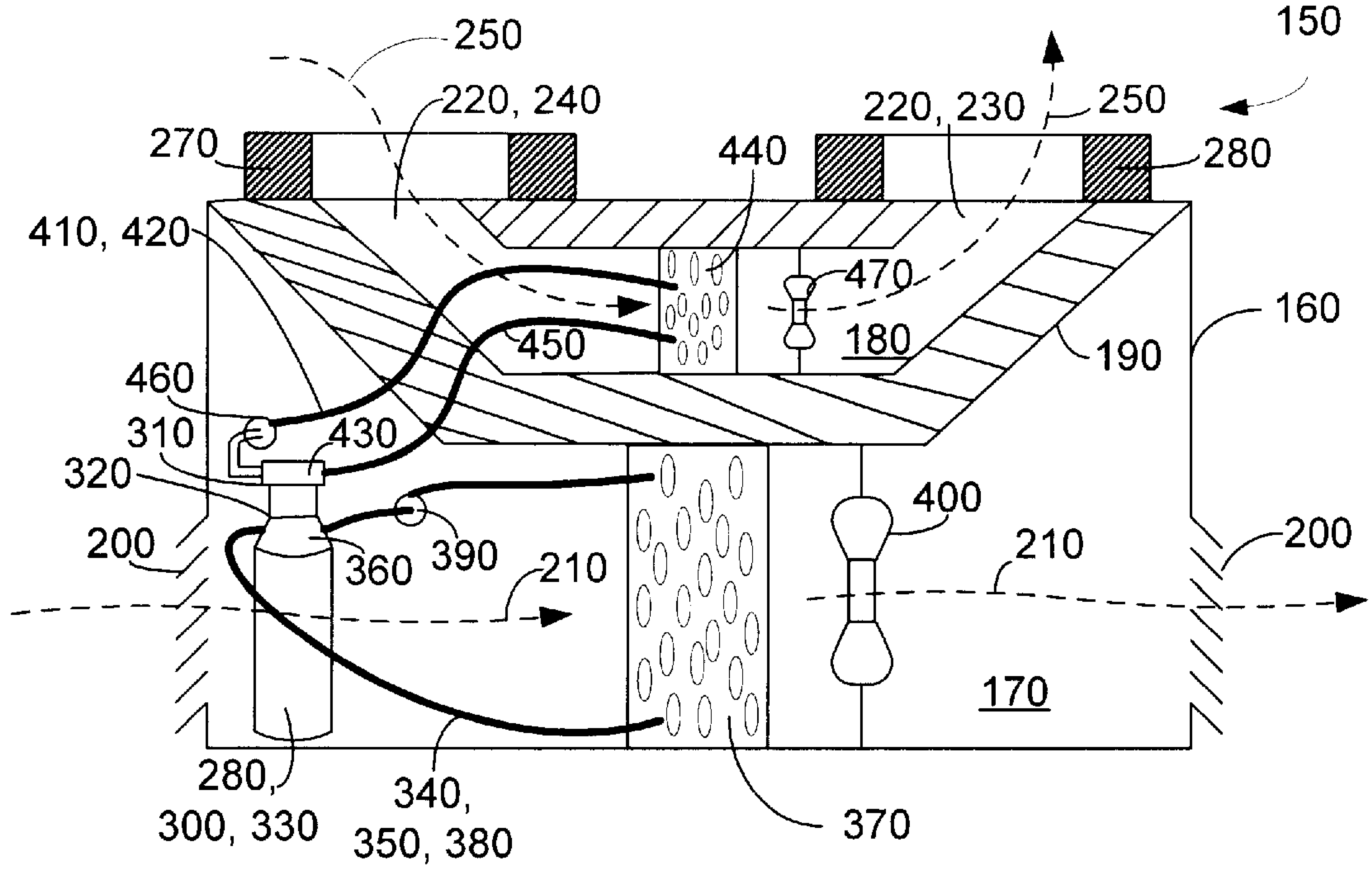
200
3

FIG. 2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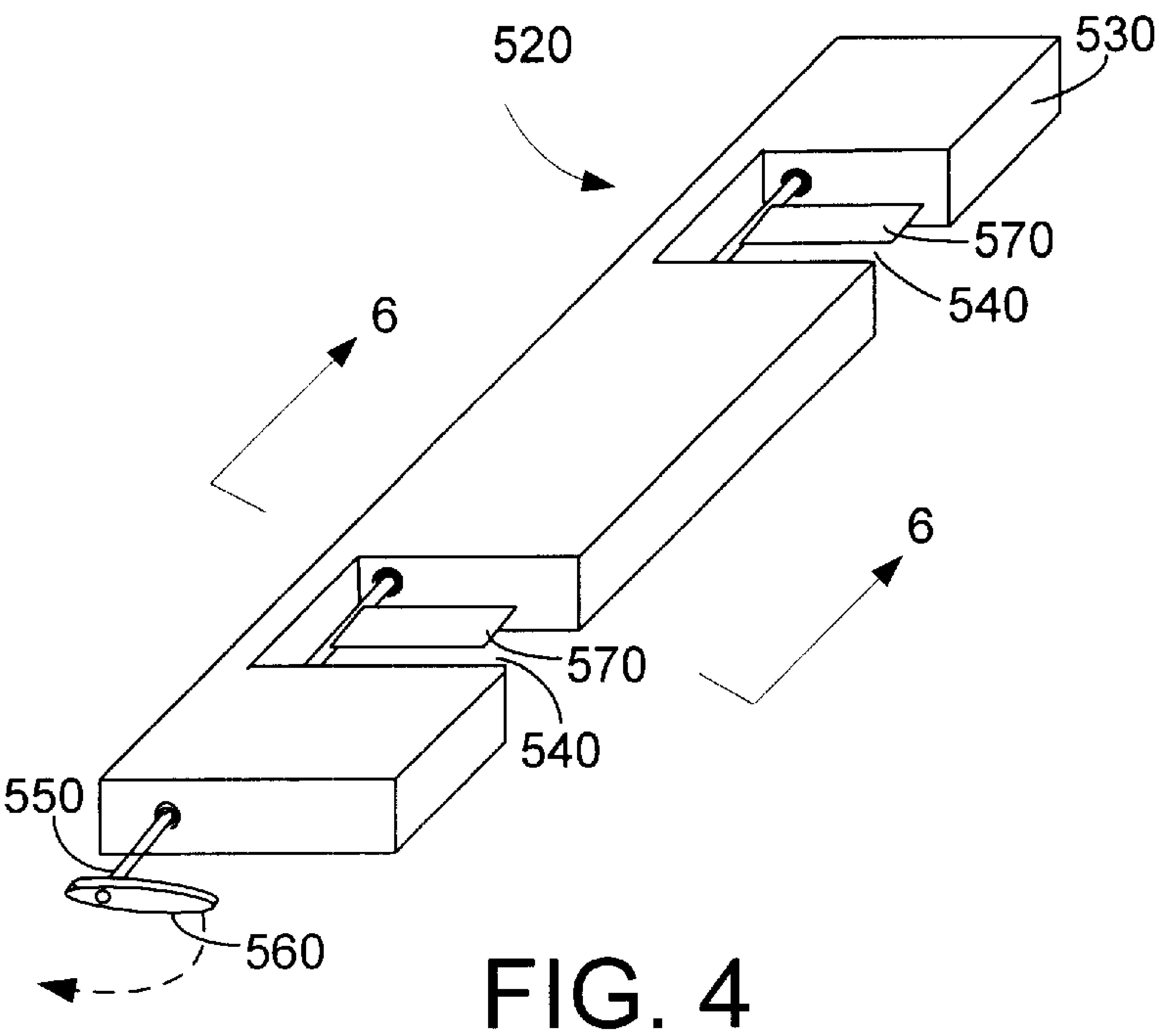
350, 380
370

FIG. 3


520
530
570
540
6
6
570
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560

FIG. 4

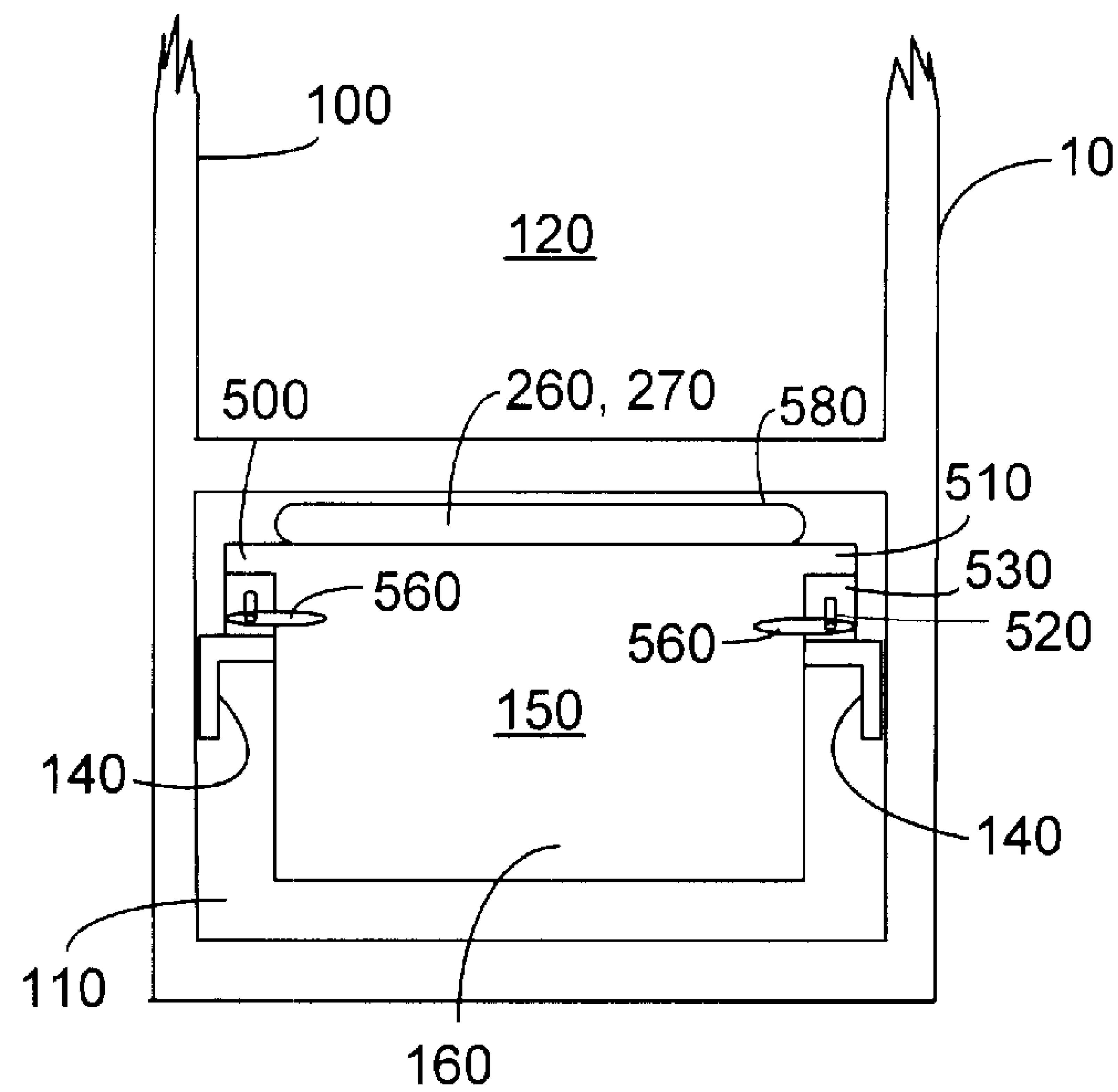

FIG. 5

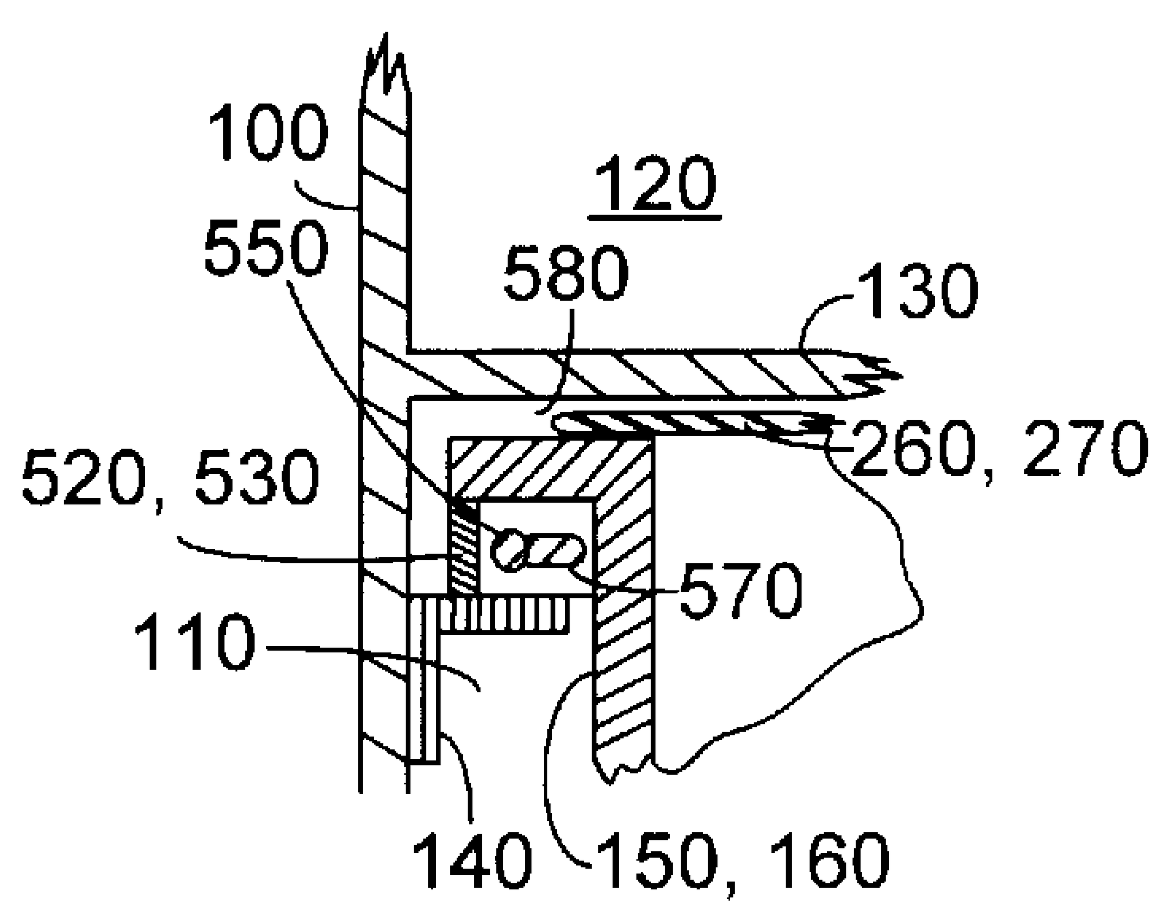

FIG. 6

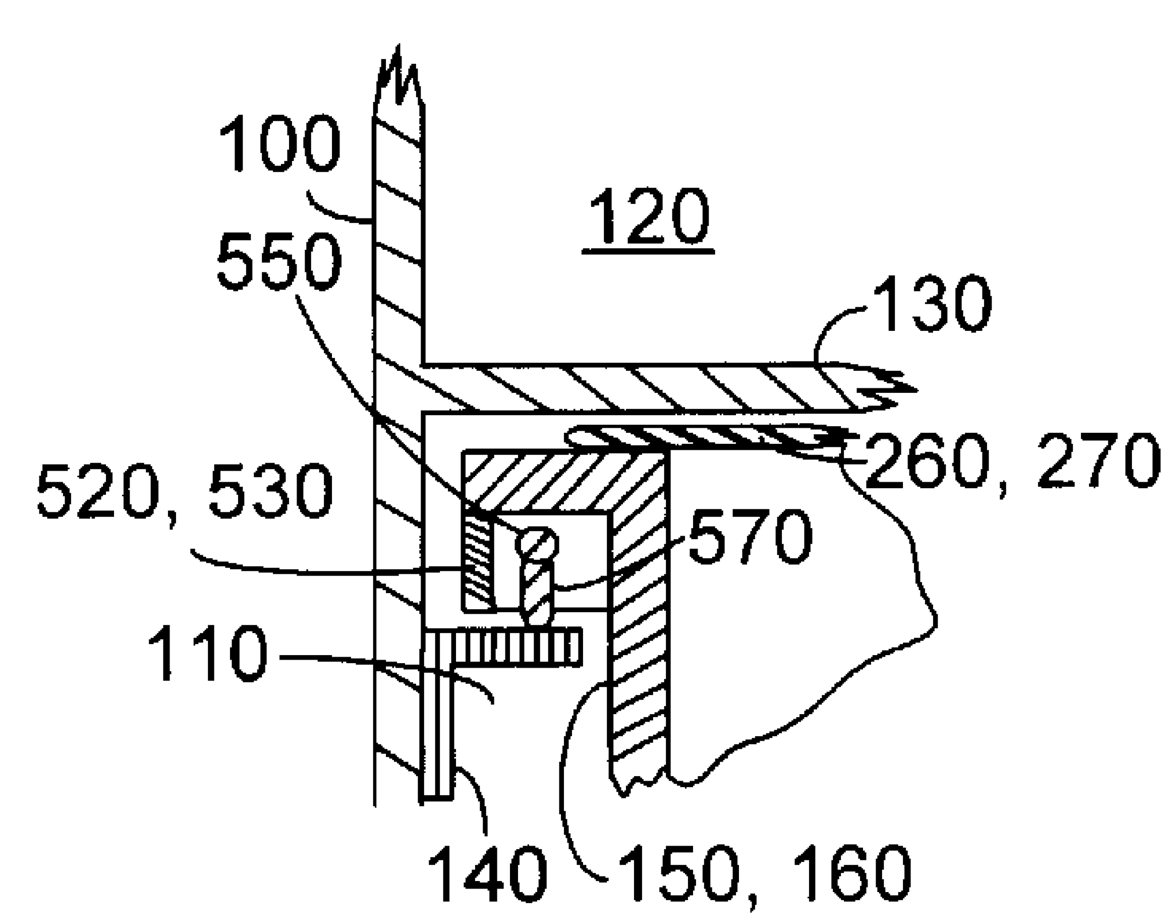

FIG. 7

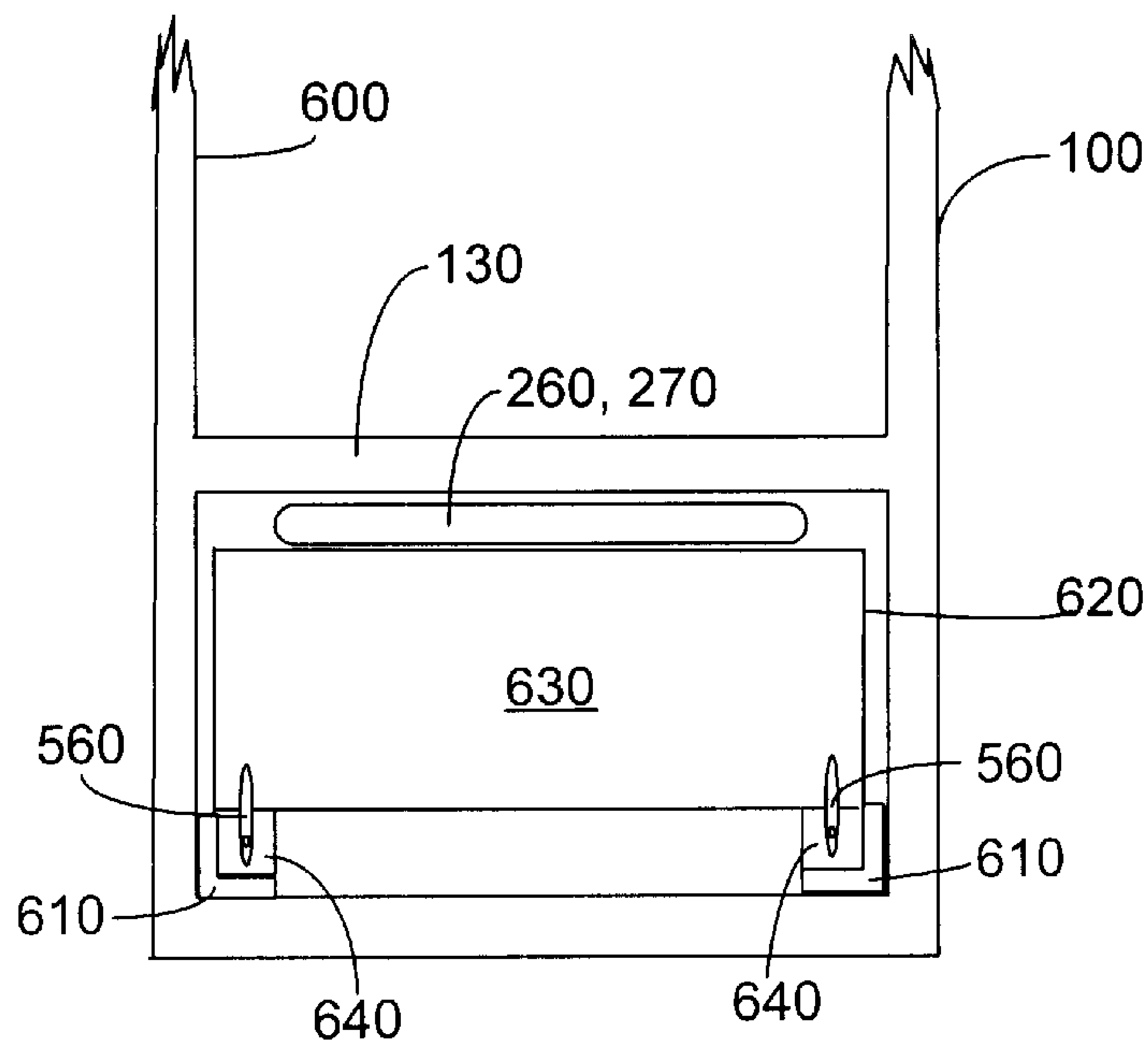

FIG. 8

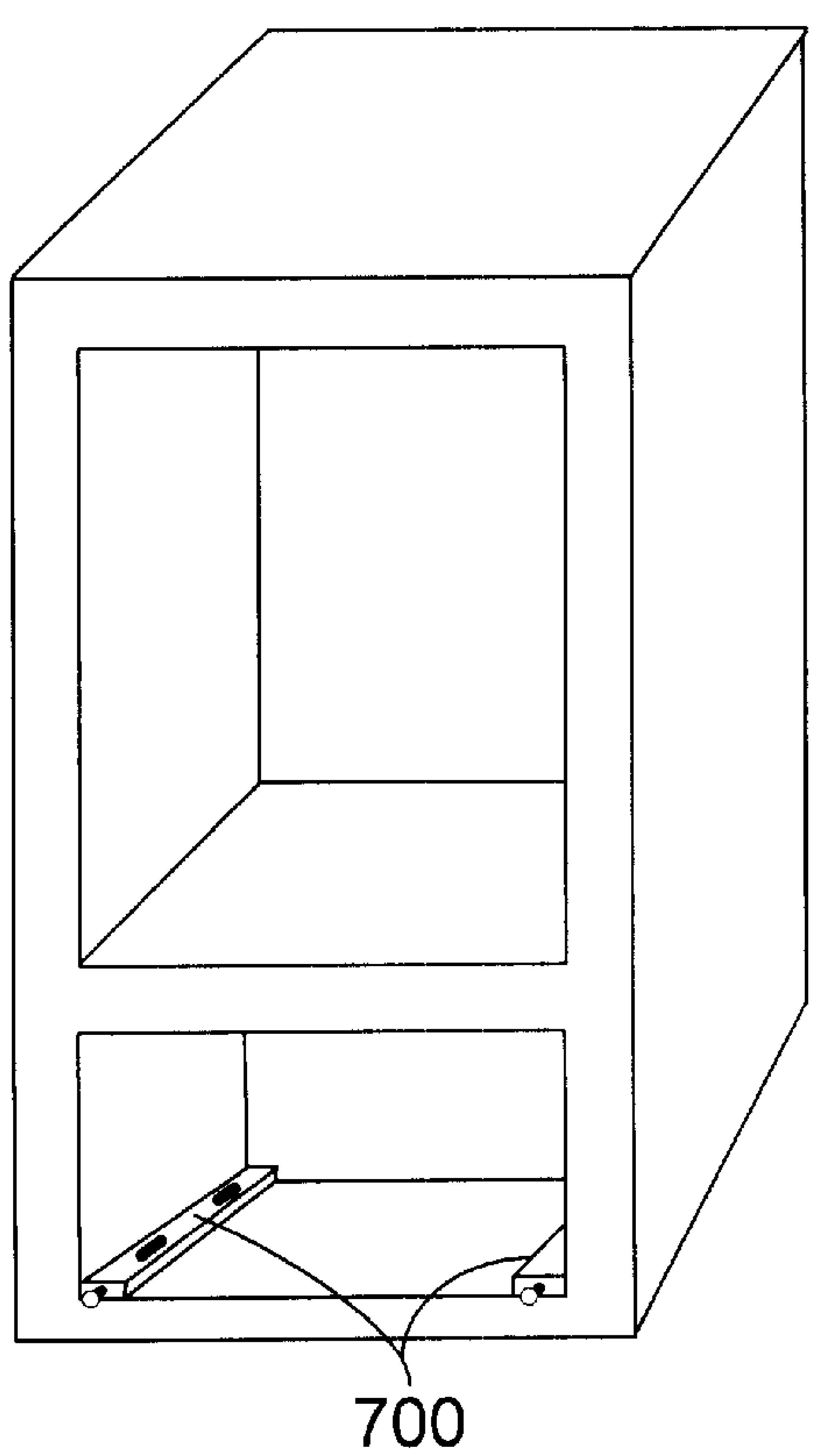

FIG. 9

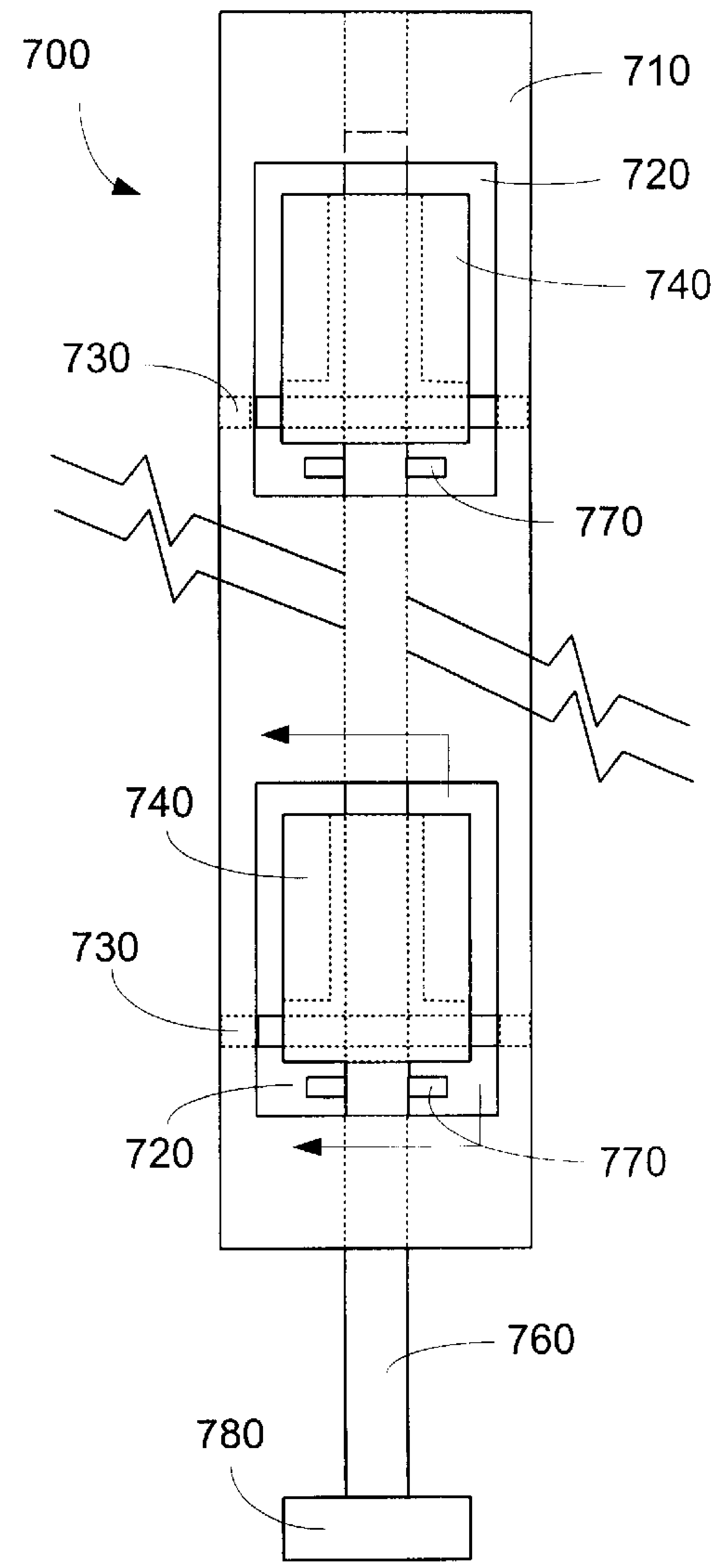

FIG. 10

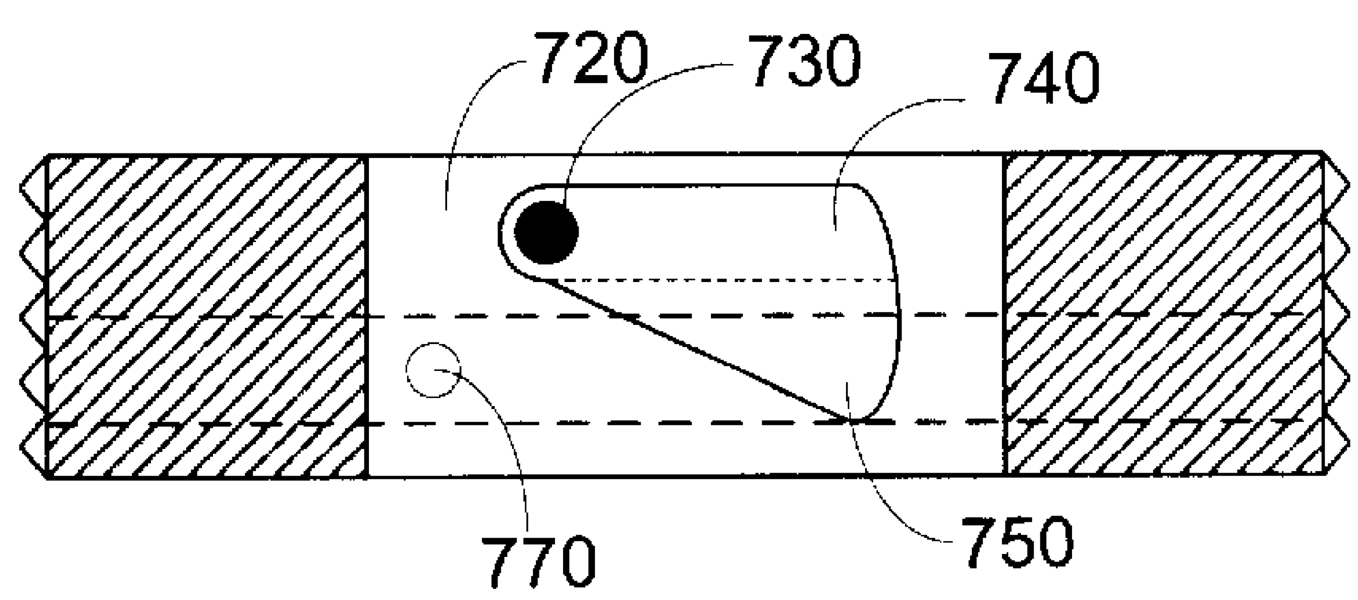

FIG. 11

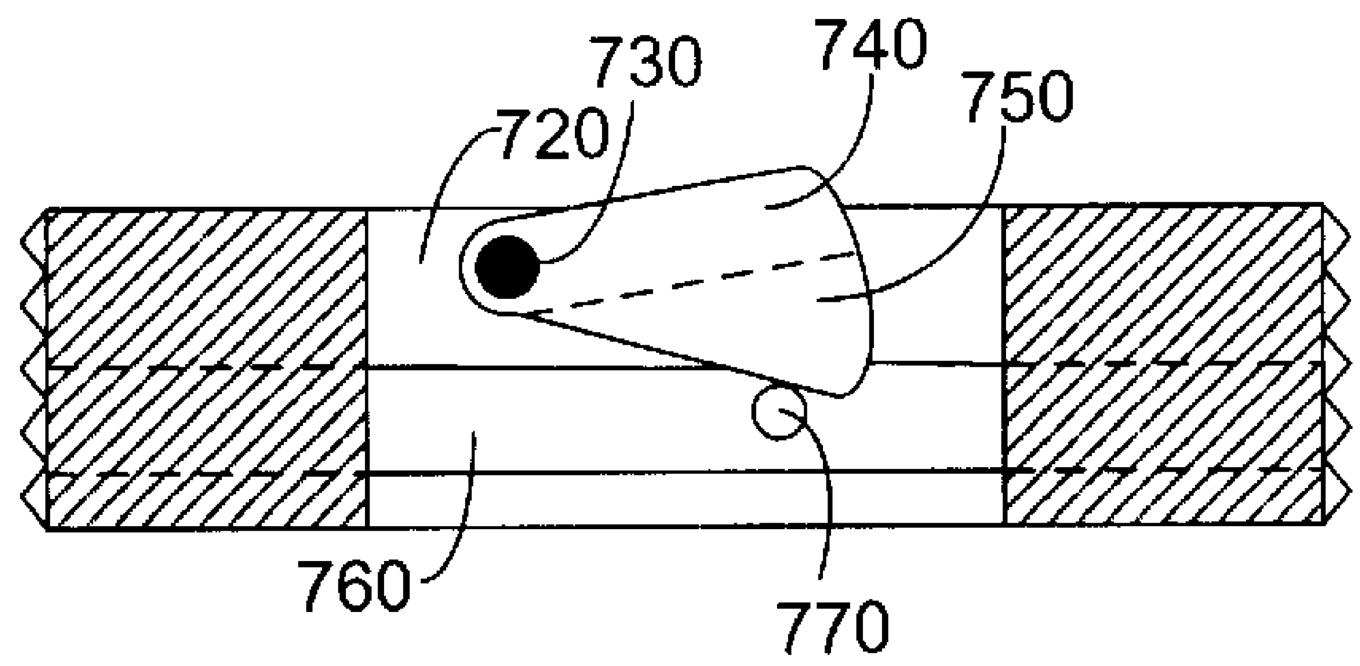

FIG. 12

SEAL COMPRESSION MECHANISM FOR A REFRIGERATION DEVICE

BACKGROUND OF INVENTION

The present invention relates generally to a refrigeration system and, more particularly, the present invention relates to a mechanism for sealing a refrigeration deck within the refrigeration system.

In the beverage industry and elsewhere, refrigeration systems are found in vending machines, glass door merchandisers ("GDM's"), and other types of dispensers and coolers. These systems generally have used a conventional vapor compression (Rankine cycle) refrigeration apparatus to chill beverages or other products therein. In the Rankine cycle apparatus, the refrigerant in the vapor phase is compressed in a compressor so as to cause an increase in temperature. The hot, high-pressure refrigerant is then circulated through a heat exchanger, called a condenser, where it is cooled by heat transfer to the surrounding environment. As a result, the refrigerant condenses from a gas back to a liquid. After leaving the condenser, the refrigerant passes through a throttling device where the pressure and the temperature of the refrigerant are reduced. The cold refrigerant leaves the throttling device and enters a second heat exchanger, called an evaporator, located in or near the refrigerated space. Heat transfer with the evaporator and the refrigerated space causes the refrigerant to evaporate or to change state from a saturated mixture of liquid and vapor into a superheated vapor. The vapor then leaves the evaporator and is drawn back into the compressor so as to repeat the cycle.

Although the Rankine cycle systems adequately chill the products therein and are in widespread use, there are several known disadvantages. First, the systems are generally large and heavy. Second, the systems may be noisy to operate. Third, the systems may have a significant power draw. Further, conventional Rankine systems generally use refrigerants for their working medium. These refrigerants are known to be harmful to the environment. The refrigerants may in some cases be noxious. In fact, although the commonly used HFC refrigerant (**134***a*) is generally assumed not to be noxious, there have been claims to the contrary. This refrigerant, however, is known to be a powerful "greenhouse" gas.

One alternative to the use of a Rankine cycle system is a Stirling cycle cooler. The Stirling cycle cooler is also a well-known heat transfer mechanism. Briefly described, a Stirling cycle cooler compresses and expands a gas (typically helium) to produce cooling. This gas shuttles back and forth through a regenerator bed to develop much greater temperature differentials than may be produced through the normal Rankine compression and expansion process. Specifically, a Stirling cooler may use a displacer to force the gas back and forth through the regenerator bed and a piston to compress and expand the gas. The regenerator bed may be a porous element with significant thermal inertia. During operation, the regenerator bed develops a temperature gradient. One end of the device thus becomes hot and the other end becomes cold. See David Bergeron, Heat Pump Technology Recommendation for a Terrestrial Battery-Free Solar Refrigerator, September 1998. Patents relating to Stirling coolers include U.S. Pat. Nos. 5,678,409; 5,647,217; 5,638,684; 5,596,875; and 4,922,722, all incorporated herein by reference.

Stirling cooler units are desirable because they are nonpolluting, efficient, and have very few moving parts. The use of Stirling coolers units has been proposed for conventional refrigerators. See U.S. Pat. No. 5,438,848, incorporated herein by reference. The integration of a free-piston Stirling cooler into a conventional refrigerated cabinet, however, requires different manufacturing, installation, and operational techniques than those used for conventional compressor systems. See D. M. Berchowitz et al., Test Results for Stirling Cycle Cooler Domestic Refrigerators, Second International Conference. As a result, the use of the Stirling coolers in, for example, beverage vending machines, GDM's, and other types of dispensers, coolers, or refrigerators is not well known.

There is a desire, therefore, for adapting Stirling cooler unit technology to conventional beverage vending machines, GDM's, dispensers, coolers, refrigerators and the like. Specifically, the Stirling cooler units used therein should be easily accessible in the case of repair or replacement while maintaining adequate efficiency. Preferably the Stirling coolers should be accessible with a minimum of down time for the enclosure as a whole and without the need for emptying the enclosure. The beverage vending machine, GDM, or other type of dispenser, cooler, or refrigerator with the Stirling cooling units therein should be both easy to use and energy and thermally efficient.

SUMMARY OF INVENTION

The present invention thus provides a refrigeration device. The refrigeration device may include a refrigeration deck frame and a refrigeration deck removably positioned within the refrigeration deck frame. The refrigeration deck may include a sealing member and a seal compression mechanism positioned thereon. The seal compression mechanism may include a rotating member so as to urge the sealing member against the refrigeration deck frame.

Specific embodiments of the refrigeration device may include the refrigeration deck having a cold compartment and a hot compartment. The refrigeration deck may include a liquid secondary loop heat exchanger. The refrigeration deck may include a Stirling cycle cooler. The refrigeration deck may include an air aperture. The air aperture may be surrounded by the sealing member. The refrigeration deck may include a return aperture and a supply aperture. The sealing member may include a supply aperture sealing member and a return aperture sealing member. The sealing member may be made out of extruded vinyl, compliant elastomeric foam, or extruded compliant foam.

The refrigeration deck may include a number of flanges. One of the seal compression mechanisms may be positioned on each of the flanges. The seal compression mechanism may include a base. The base may be made out of a material with a low coefficient of friction. The base may include a number of apertures therein. A shaft may be positioned for rotation within the base. The rotating member may be fixedly attached to the shaft. A handle may be connected to the shaft such that rotation of the handle will cause rotation of the rotating member. The rotating member may include a tab, a cam, or an elongated member.

The seal compression mechanism may include a shaft positioned for horizontal motion within the base. The shaft may have one or more pins positioned thereon. The rotating member may include a number of cams positioned within the base such that the cams may ride along the pins of the shaft.

The refrigeration deck frame may include a number of rails such that the refrigeration deck may slide thereon. The rotating member of the seal compression mechanism may rotate against the rails so as to lift the refrigeration deck. The refrigeration deck frame may include a first end and a second end. The rails may be positioned about the first end. The rotating member may urge the sealing member against the refrigeration deck frame with less than one (1) revolution or about ninety (90) degrees of rotation.

A further embodiment of the present invention may provide for a refrigeration deck for use in a refrigeration device. The refrigeration deck may include an outer frame and a refrigeration device positioned within the outer frame. A sealing member and a sealing member compression device may be positioned on the outer frame. The sealing member compression device may include a rotating member. The rotating member may urge the sealing member against the refrigeration device with less than one (1) revolution. The rotating member may include a tab, a cam, or an elongated member. The refrigeration device may be a Stirling cycle cooler.

A further embodiment of the present invention may provide for a refrigeration device. The refrigeration device may include a refrigeration deck frame with a refrigeration deck removably positioned therein. A sealing member may be positioned between the refrigeration deck and the refrigeration deck frame. A seal compression mechanism may be positioned about the refrigeration deck and the refrigeration deck frame. The seal compression mechanism may include a rotating member so as to urge the refrigeration deck and the sealing member against the refrigeration deck frame.

The deck may include a Stirling cycle cooler. The sealing member may include compliant foam, rubber, or vinyl. The sealing member and the seal compression mechanism may be attached to the refrigeration deck or the refrigeration deck frame.

The seal compression mechanism may include a base. The base may include a number of apertures therein. A shaft may be positioned for horizontal motion within the base. The shaft may include one or more pins positioned thereon. The rotating member may include a number of cams positioned within the base such that the cams may ride along the pins of the shaft. The cams may include one or more pairs of ramps with a gap therebetween. The rotating member may urge the sealing member against the refrigeration deck frame with less than one (1) revolution.

The method of the present invention may provide for sealing a refrigeration deck within a refrigeration deck frame. The refrigeration deck may include a sealing member and a sealing member compression device. The refrigeration deck frame may include a number of rails positioned therein. The method may include the steps of sliding the refrigeration deck into the refrigeration deck frame along the rails and rotating the sealing member compression device against the rails so as to lift the refrigeration deck and compress the sealing member against the refrigeration deck frame. The refrigeration deck may include a Stirling cycle cooler. The method further may include the step of operating the Stirling cycle cooler.

These and other features of the present invention will become apparent upon review of the following detailed description of the disclosed embodiments when taken in consideration with the drawings and the appended claims.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a plan view of a refrigeration device for use with the present invention.

FIG. **2** is a perspective view of a refrigeration deck of the present invention.

FIG. **3** is a side cross-sectional view of the refrigeration deck of FIG. **2**, taken along line **3—3**.

FIG. **4** is perspective view of the seal compression mechanism of the present invention.

FIG. **5** is a plan view of a refrigeration device with the refrigeration deck of FIG. **2** positioned therein.

FIG. **6** is a side cross-sectional view of the refrigeration deck positioned within the refrigeration device taken along line **6—6**.

FIG. **7** is a side cross-sectional view of the refrigeration deck positioned within the refrigeration device taken along line **6—6**.

FIG. **8** is a plan view of an alternative refrigeration deck positioned within the refrigeration device.

FIG. **9** is a perspective view of an alternative seal compression mechanism positioned within the refrigeration deck.

FIG. **10**. is a cross-sectional view of an alternative seal compression mechanism.

FIG. **11**. is a plan view of the alternative seal compression mechanism in the disengaged position.

FIG. **12**. is a plan view of the alternative seal compression mechanism in the engaged position.

DETAILED DESCRIPTION

Referring now to the drawings, in which like numerals refer to like elements throughout the several views, FIG. **1** shows a refrigeration device **100** for use with the present invention. The refrigeration device **100** may be any type of refrigerated space, such as a refrigerator, a merchandiser, a vending machine, a cooler, a beverage dispenser, or similar types of devices. The refrigeration device **100** may have any desired size, shape, or capacity. The design and organization of the refrigeration device **100** should not limit the scope or applicability or the components described in detail below. Specifically, any type of configuration of the refrigeration device **100** may be used herein. Further, the present invention also may be used with a means to heat a given space as opposed to the refrigeration device **100** described herein.

The refrigeration device **100** may have a refrigeration deck area **110** and a chilled area **120**. The refrigeration deck components, as will be described in more detail below, may be positioned largely within or in communication with the refrigeration deck area **110**. The products, fluids, or other items to be chilled may be positioned within or in communication with the chilled area **120**. The refrigeration deck area **110** may be positioned on the top or the bottom of the refrigeration device **100**. One or more frame members **130** may define the refrigeration deck area **170**, the chilled area **120**, and the refrigeration device **100** as a whole.

Attached to the frame members **130** may be a number of tracks **140**. The tracks **140** may be positioned within the refrigeration deck area **110**. The tracks **140** may be made out of steel, aluminum, or similar types of materials. The tracks **140** may be largely "L"-shaped. The tracks **140** may be positioned a pre-determined distance beneath the top or the bottom of the refrigeration deck area **110**.

FIGS. **2** and **3** show a refrigeration deck **150** of the present invention. The refrigeration deck **150** may include an outer frame **160**. The outer frame **160** may be in the form of a largely self-contained box or a similar type of structure. The outer frame **160** may be made out of steel, aluminum, or similar types of materials. The outer frame **160** may be insulated.

The refrigeration deck **150** may include an internal hot compartment **170** and an internal cold compartment **180**. A divider **190** may separate the hot compartment **170** and the cold compartment **180**. The divider **190** may be insulated. The refrigeration deck **150** may include a number of hot air vents **200** positioned about the hot air compartment **170** of the outer frame **160**. The hot air vents **200** may be positioned so as to define a hot air path **210** through the outer frame **160**. The refrigeration deck **150** also may define a number of cold air openings **220** positioned adjacent to the cold compartment **180** of the outer frame **160**. The cold air openings **220** may define a supply air opening **230** and a return air opening **240**. The cold air openings **220** may define a cold air path **250** extending from the return opening **240** to the supply opening **230**. The frame member **130** also may include a number of apertures so as to communicate with the supply opening **230** and the return opening **240**.

A supply opening sealing layer **260** may surround the supply opening **230**. A return opening sealing layer **270** may surround the return opening **240**. The sealing layers **260, 270** may take the form of a raised foam layer, an extruded hollow section, or a similar type of structure. The sealing layers **260, 270** may be about 1.2 to about 1.6 centimeters in thickness (uncompressed) and may be about 2.5 to about 3.5 centimeters in width. Any dimensions, however, may be used. The sealing layers **260, 270** may be made out of an elastic material such as vinyl, rubber, or similar types of material so as to provide a substantially air tight seal surrounding the cold air openings **220**.

Positioned within the outer frame **160** of the refrigeration deck **150** may be a number of refrigeration components **280**. In this embodiment, a Stirling cooler **300** is shown. As is well known, a Stirling cooler may include a cold end **310** and a hot end **320**. The Stirling cooler **300** may be driven by a free piston (not shown) positioned within a casing **330**. By way of example, the Global Cooling Company of Athens, Ohio may manufacture a Stirling cooler **300** suitable for use with the present invention. Any conventional type of Stirling cooler **300**, however, may be used herein. Further, any number of Stirling coolers **300** may be used herein. Although the use of the Stirling cooler **300** has been shown herein, any other type of refrigeration system may be used. For example, a Rankine cycle or a transcritical carbon dioxide cycle system also may be used within the refrigeration deck **150**.

The Stirling cooler **300** may be positioned within the hot compartment **170** of the refrigeration deck **150**. Alternatively, the Stirling cooler **300** may be positioned with the hot end **320** positioned within the hot compartment **170** while the cold end **310** may be positioned on the other side of the divider **190** within the cold compartment **180**. Any suitable positioning of the Stirling cooler **300** may be used.

The refrigeration components **280** also may include a hot compartment heat transfer system **340**. The hot compartment heat transfer system **340** may be positioned within the hot compartment **170** of the refrigeration deck **150**. In the embodiment, the hot compartment heat transfer system **340** may include a liquid secondary loop heat exchanger **350**. Alternatively, a thermosiphon, a radial fin, or a similar system may be used. The liquid secondary loop heat exchanger **350** may include a fluid heat exchanger **360** attached to the hot end **320** of the Stirling cooler **300**. The liquid secondary loop heat exchanger **350** also may include a hot end heat exchanger **370** positioned within the hot air path **210**. The hot end heat exchanger **370** may be a conventional fin and tube type heat exchanger. Alternatively, a microchannel hex or a roll bonded hex also may be used. The fluid heat exchanger **360** and the hot end heat exchanger **370** may be connected by a series of tubing **380**. The tubing **380** may be made out of vinyl, rubber, or similar types of materials. The tubing **380** may be insulated. A pump **390** also may be positioned between the fluid heat exchanger **360** and the hot end heat exchanger **370** so as to pump the refrigeration fluid through the liquid secondary loop heat exchanger **350**. The pump **390** may have a capacity of about 500 to 1,500 milliliters per minute. A fan **400** may be positioned adjacent to the hot end heat exchanger **370** so as to force air along the cold air path **250**. The fan **400** may have a capacity of about 100 to 200 cubic feet per minute.

The refrigeration components **280** may include a cold compartment heat transfer system **410**. The cold compartment heat transfer system **410** may be positioned within the cold compartment **180** of the refrigeration deck **150**. In the embodiment, the cold compartment heat transfer system **410** may include a liquid secondary loop heat exchanger **420**. Alternatively, a thermosiphon, a finned cold plate, or a similar system may be used. The liquid secondary loop heat exchanger **420** may include a fluid heat exchanger **430** attached to the cold end **310** of the Stirling cooler **300**. The liquid secondary loop heat exchanger **420** also may include a cold end heat exchanger **440** positioned within the cold air path **250**. The cold end heat exchanger **440** may be a conventional fin and tube type heat exchanger. Alternatively, a roll bonded hex or a microchannel hex also may be used. The fluid heat exchanger **430** and the cold end heat exchanger **440** may be connected by a series of tubing **450**. The tubing **450** may be made out of vinyl, rubber, or similar types of materials. The tubing **450** may be insulated. A pump **460** also may be positioned between the fluid heat exchanger **430** and the cold end heat exchanger **440** so as to pump the refrigeration fluid through the liquid secondary loop heat exchanger **420**. The pump **460** may have a capacity of about 500 to 1,500 milliliters per minute. A fan **470** may be positioned adjacent to the cold end heat exchanger **440** so as to force air along the cold air path **250**. The fan **470** may have a capacity of about 100 to 200 cubic feet per minute.

The outer frame **160** of the refrigeration deck **150** may include a number of flanges, in this case a first upper flange **500** and a second upper flange **510**. The flanges **500, 510** may be positioned about the top of the outer frame **160**. The flanges **500, 510** may be integral with the outer frame **160** or the flanges **500, 510** may be fixedly attached thereto.

As is shown in FIGS. **2** and **4**, a seal compression mechanism **520** may be mounted underneath each upper flange **500, 510**. The seal compression mechanism **520** may include a block **530**. The block **530** preferably may be made with a material having a low coefficient of friction. The block **530** may be made out of a plastic such as Delrin (acetal resin), Celcon (acetal copolymer), nylon, UHMWPE (ultra-high molecular weight polyethylene), or similar types of materials. Alternatively, other types of plastics also may be used.

The block **530** may have a number of notches **540** positioned therein. In this embodiment, two notches **540** may be used. Any number of notches **540**, however, may be used. The notches **540** will be sized as is described in more detail below. A shaft **550** may run through the block **530** and extend through the notches **540**. The shaft **550** may be made out of a metal such as steel, aluminum, or similar types of materials. A handle **560** may be attached to one end of the shaft **550**.

Attached to the shaft **550** and positioned within each of notches **540** may be a tab **570**. The tabs **570** may be attached to the shaft **550** by welding, a set screw, or similar types of joinder means. One tab **570** may be positioned within each of the notches **540**. Any number of tabs **570** may be used. The tabs **570** may be made out of metal, plastic, or similar types of materials. The tabs **570** may be positioned onto the shaft **550** such that the tabs **570** rotate with the shaft **550** when the handle **560** is rotated.

FIG. **5** shows the positioning of the refrigeration deck **150** within the refrigeration deck area **110** of the refrigeration device **100**. Specifically, the block **530** of the seal compression mechanism **520** is positioned along the tracks **140** within the refrigeration deck area **110**. The refrigeration deck **150** may slide in and out of the refrigeration deck area **110** along the tracks **140**.

FIGS. **6** and **7** show the use of the seal compression mechanism **520**. In FIG. **6**, the seal compression mechanism **520** is unengaged. As can be seen, the sealing layers **260**, **270** are in their uncompressed state and a gap **580** exists between the sealing layers **260**, **270** and the frame member **130** that acts as the floor for the chilled area **120**. As is shown in FIG. **7**, when the handle **560** of the seal compression mechanism **520** is rotated, the shaft **550** rotates the tabs **570** against the tracks **140**. The refrigeration deck **150** as a whole is then forced towards the frame member **130** as the tabs **570** lift the refrigeration deck **150**. The sealing layers **260**, **270** are compressed so as to define a substantially air tight seal around the supply opening **230** and the return opening **240**. Specifically, the tabs **570** act as cams to push against the tracks **140** at all four (4) corners so as to lift the refrigeration deck **150** straight up and uniformly compress the sealing layers **260**, **270**. The refrigeration deck **150** is thus adequately sealed within the refrigeration deck area **110** of the refrigeration device **100**.

In removing the refrigeration deck **150** from the refrigeration deck area **110**, the handle **560** of the seal compression mechanism **520** is simply rotated such that the tabs **570** disengage from the tracks **140**. The refrigeration deck **150** as a whole is then lowered such that the blocks **530** come in contact with the tracks **140**. The sealing layers **260**, **270** may disengage from the frame member **130** and the gap **580** may reappear. The sealing layers **260**, **270** may be compressed from about 1.2 to about 1.6 centimeters to about 0.8 to about 1.0 centimeters. The dimension may vary according to the size of the refrigeration device **100** as a whole. The refrigeration deck **150** may then be slid along the tracks **140** and removed from the refrigeration deck area **110** of the refrigeration device **100**.

FIG. **8** shows an alternative embodiment of the present invention, a refrigeration device **600**. The refrigeration device **600** may be substantially identical to the refrigeration device **100** described above, with the exception that a pair of tracks **610** may be positioned at the bottom of a refrigeration deck area **620** as opposed to the positioning of the tracks **140** near the top of the refrigeration deck **110**. A refrigeration deck **630** may be substantially identical to the refrigeration deck **150** described above, with the exception that the flanges **500**, **510** may be not be required. Rather, a number of seal compression mechanisms **640** may be mounted on the bottom of the refrigeration deck **630**.

In this configuration, the refrigeration deck **630** may be slid across the tracks **610** into place within the refrigeration deck area **620**. The seal compression mechanism **640** then may operate in a substantially identical manner to that described above. Specifically, by turning the handles **560**, the shaft **550** rotates the tabs **570** so as to elevate the refrigeration deck **630** into place. In raising the refrigeration deck **630**, the sealing layers **260**, **270** may form a substantially air tight seal against the frame member **130**.

A further embodiment of the present invention is shown in FIGS. **9–12**, a refrigeration device **650**. The refrigeration device **650** may be substantially identical to the refrigeration device **100** described above, with the exception that the tracks **140** may be omitted. Likewise, a refrigeration deck **660** may be substantially identical to the refrigeration deck **150** described above, with the exception that the flanges **500**, **510** may be not be required.

In this embodiment, a pair of seal compression mechanisms **700** may be located at the bottom edges of the refrigeration device **650**. Referring to FIG. **10**, each seal compression mechanism **700** may include a block **710** with two or more apertures **720** therein. The block **710** may be similar to the block **530** described above. A lifting cam **740** may be located in each aperture **720**. The lifting cams **740** may be made out of metal, plastic, or similar types of materials. A hinge pin **730** may anchor the lifting cam **740** within the aperture **720** of the block **710**. The lifting cams **740** may pivot about the hinge pin **730**. The lifting cams **740** may include two actuation ramps **750** located thereon. The actuation ramps **750** may be placed so as to define a gap between them.

A rod **760** may run substantially all the way through the block **710** and extend beyond the block **710** so as to terminate in a handle **780**. Inside each aperture **720**, two actuation pins **770** may extend perpendicularly from the rod **760**. As is shown in FIG. **11**, the rod **760** rests between the actuation ramps **750** in the retracted position. The top surface of the actuation ramp **750** may be parallel to and flush with or slightly below the top surface of block **710**. As is shown in FIG. **12**, the rod **760** slides within the block **710** such that the actuation pins **770** contact the actuation ramps **750** of the actuation cams **740** in the engaged position. As the rod **760** continues forward, the actuation cams **750** angle up so as to push on the bottom of the refrigeration deck **610**.

In use, the refrigeration deck **610** slides into the refrigeration device **650** such that the deck **610** rests on the blocks **710**. When the deck **610** is fully inserted, the user pushes in on the handles **780** such that the actuation pins **770** raise the deck **610** and compress the seals **260**, **270**. To remove the deck **650**, the user pulls the handles **780** out, so as to return the actuator ramps **750** to the retracted position. The configuration shown in this embodiment could be inverted such that the seal compression mechanisms **700** are attached to the bottom of the deck **650** and act against the tracks similar to those shown in FIG. **8**.

It should be apparent that the foregoing relates only to the preferred embodiments of the present invention and that numerous changes and modifications may be made herein without departing from the spirit and scope of the invention as defined by the following claims and the equivalents thereof.

I claim:

1. A refrigeration device, comprising:

a refrigeration deck frame; and

a refrigeration deck removably positioned within said refrigeration deck frame;

said refrigeration deck comprising a sealing member positioned thereon;

said refrigeration deck comprising a seal compression mechanism positioned thereon;

said seal compression mechanism comprising a rotating member so as to urge said sealing member against said refrigeration deck frame.

2. The refrigeration device of claim **1**, wherein said sealing member comprises compliant foam, rubber, or vinyl.

3. The refrigeration device of claim 1, wherein said refrigeration deck comprises a plurality of flanges and wherein said seal compression mechanism comprises a plurality of seal compression mechanisms such that one of said plurality of seal compression mechanisms is positioned on said plurality of flanges.

4. The refrigeration device of claim 1, wherein said seal compression mechanism comprises a base.

5. The refrigeration device of claim 1, wherein said base comprises a low coefficient of friction.

6. The refrigeration device claim 4, wherein said base comprises a plurality of apertures therein.

7. The refrigeration device of claim 4, wherein said seal compression mechanism comprises a shaft positioned for rotation within said base and wherein said rotating member is fixedly attached to said shaft.

8. The refrigeration device of claim 7, wherein said seal compression mechanism comprises a handle connected to said shaft such that rotation of said handle will cause rotation of said rotating member.

9. The refrigeration device of claim 4, wherein said seal compression mechanism comprises a shaft positioned for horizontal motion within said base.

10. The refrigeration device of claim 9, wherein said shaft comprises one or more pins positioned thereon.

11. The refrigeration device of claim 10, wherein said rotating member comprises a plurality of cams positioned within said base such that said plurality of cams may ride along said one or more pins of said shaft.

12. The refrigeration device of claim 1, wherein said rotating member comprises a tab.

13. The refrigeration device of claim 1, wherein said rotating member comprises a cam.

14. The refrigeration device of claim 1, wherein said rotating member comprises an elongated member.

15. The refrigeration device of claim 1, wherein said refrigeration deck frame comprises a plurality of rails such that said refrigeration deck may slide thereon.

16. The refrigeration device of claim 15, wherein said rotating member of said seal compression mechanism rotates against said plurality of rails so as to lift said refrigeration deck.

17. The refrigeration device of claim 1, wherein said rotating member urges said sealing member against said refrigeration deck frame with less than one (1) revolution.

18. The refrigeration device of claim 17, wherein said rotating member urges said sealing member against said refrigeration deck frame with about ninety (90) degrees of rotation.

19. A refrigeration deck for use in a refrigeration device, comprising:

an outer frame;

a refrigeration device positioned within said outer frame;

a sealing member positioned on said outer frame; and

a sealing member compression device positioned on said outer frame;

said sealing member compression device comprising a rotating member such that said rotating member may urge said sealing member against the refrigeration device with less than one (1) revolution.

20. A method for sealing a refrigeration deck within a refrigeration deck frame, said refrigeration deck including a sealing member and a sealing member compression device, said refrigeration deck frame including a number of rails positioned therein, said method comprising the steps of:

sliding said refrigeration deck into said refrigeration deck frame along said rails; and

rotating said sealing member compression device against said rails so as to lift said refrigeration deck and to compress said sealing member against said refrigeration deck frame.

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